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I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PS 1871 for a patent by BAKENOMICS PTY LTD as filed on 22 April 2002.



WITNESS my hand this
Eighth day of July 2003

J. Billingsley

JULIE BILLINGSLEY
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AUSTRALIA

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PROVISIONAL SPECIFICATION

**Invention Title: "A METHOD OF PRODUCING A PRODUCTION
RUN OF BAKERY PRODUCTS"**

The invention is described in the following statement:

TITLE

A METHOD OF PRODUCING A PRODUCTION RUN OF BAKERY
PRODUCTS

FIELD OF THE INVENTION

5 This invention relates to a method of producing a production
run of bakery products. Specifically, this invention relates to a method of
producing a production run of bread products and therefore will be described
in this context. However, it should be appreciated that other bakery products
such as biscuits, cakes and/or buns or the like may be produced using the
10 method.

BACKGROUND OF THE INVENTION

Consumers today demand a large variety of bakery products.
For example, it is not unusual for a bakery to produce rolls, loaves and/or
buns of varying weights and shapes from white dough, wholemeal dough,
15 oat bran dough, soy linseed dough and fruit dough. When a combination of
these bakery products are produced it is not unusual for over one hundred
bakery products to be produced in a single production run.

Supermarkets often require different production runs compared
to small boutique bakeries. For example, supermarkets normally want their
20 shelves full of bread at opening and run only smaller production runs during
the day. Boutique bakeries may only bake their products in a single
production run or bake their products continuously through the day.

It is usual that demand for bakery products varies throughout a

single week. For example, weekend demand is normally higher than weekday demand. More exotic bakery products are also required on weekends.

5 It requires great skill and expertise to schedule a production run to produce all of the desired bakery products by a specified time. The major difficulty with producing a large variety of bakery products is there is often a large wastage of dough. It is not unusual for bakeries to waste up to 20 percent of dough from each batch. Further, once a production run has been planned it is difficult to change a production run mid stream without creating
10 substantial waste. Still further, it is preferable that full bags of flour are used as partially full opened bags need to be decanted and weighted prior to use.

OBJECT OF THE INVENTION

It is an object of the invention to overcome or alleviate one or more of the aforementioned disadvantages and/or provide the consumer with
15 a useful or commercial choice.

SUMMARY OF THE INVENTION

In one form, although not necessarily the only or broadest form, the invention resides in a method for scheduling a production run of bakery products including the steps of:

20 determining bakery products to be produced including a dough type, a weight of dough of each said bakery product and a number of said bakery products to be produced;

organising each bakery product into a group according to the

dough type;

calculating a total weight of dough of each bakery product to be produced;

5 calculating a number of full batches that can be produced of each bakery product;

calculating a weight of dough for each bakery product that cannot be produced in a full batch; and

combining a weight of dough for bakery products of the same dough type that cannot be produced in a full batch into a full batch.

10 A production run can be defined as bakery products that are produced in a plurality of batches.

A batch can be defined as a single weight of dough mixed at one time for baking.

15 Preferably, the above method is completed using a computer program and a database.

Preferably, each batch is displayed on a visual display unit. Each batch may be displayed graphically on the visual display unit. The bakery products produced in each batch may be identified graphically.

20 Preferably, the number of the bakery products can be changed to obtain full batches for the production run. Preferably amendments may be made to a production run.

Preferably, the sequence of batches in a production run may be varied to suit specific requirements.

Preferably, an ingredient list is provided for each dough type. The ingredient list may be entered and/or changed for each dough type. The weight of ingredients for individual batches may be calculated dependent upon the total weight of the batch.

5 A schematic layout of how dough pieces are to be arranged on baking trays or in containers, prior to proving or baking, may be displayed graphically.

Preferably, the computer program controls or works in conjunction with a mixing machine.

10 Logs may be available to monitor historical baking times, batch production and production runs.

The day's production run may be used to calculate the total flour requirement for the day.

BRIEF DESCRIPTION OF THE DRAWINGS

15 An embodiment of the invention, by way of example only, will now be described with reference to the accompanying figures in which:

FIG. 1 is a table representing the type of bakery products to be produced;

FIG. 2 is a modified table of FIG. 1;

20 FIG. 3 is a graph representing a white dough production schedule for the table of FIG. 1;

FIG. 4 is a graph representing a white dough production schedule for the table of FIG. 2;

FIG. 5 is a graph representing a modified white dough production schedule of FIG. 4;

FIG. 6 is a graph representing a wholemeal dough production schedule for the table of FIG. 1; and

5 FIG. 7 is a graph representing a wholemeal dough production schedule for the table of FIG. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In this embodiment of the invention, a computer program and database has been developed to assist in producing a production run of bakery products. The computer program is run in conjunction with a mixing
10 machine such as the Genesis baking machine manufactured by Bakenomics of Narangba, Queensland, Australia.

To commence operation of the computer program, an operator enters the bakery products that are to be baked. A list of bakery products to
15 be produced is shown in FIG. 1. Normally, the bakery products are associated with individual codes, eg White Hi Top = WHT, but for ease of reference the full name of each of the bakery products has been included in the table. The database contains a full description of each product and is retrieved through use of the individual code.

20 The weight of each of the bakery products is automatically obtained from the database. The weight of each bakery product is the weight of the dough that is required to produce the bakery product. The operator then enters the number of each of the bakery products that are

desired.

The total weight of dough that is required to produce each of the desired number of each of the bakery products is calculated. The total weight is obtained using the following formula:

5
$$\text{Product Weight} \times \text{Number Required} = \text{Total Weight}$$

Using the Genesis machine, a batch of 80 kg is produced using four 12.5 kg bags. A single bag of flour is used to mix 20 kg of dough. It should be appreciated that batch sizes may be increased or decreased depending upon the capabilities of the machine and/or size of the flour bags.

10 The number of full batches that are needed to produce the number of each of the bakery products is then calculated by the following formula:

$$\text{Total Weight} / \text{Batch Size} = \text{No of Full Batches}$$

15 Depending on number of bakery products that are required, there is often remaining kilograms of bakery product that cannot be produced in a single batch. That is, there is left over bakery product. This remaining weight of bakery product must still be produced to obtain the desired number of product. This method allows the remaining product to be located at a start of a batch. The mixing machine allows a quick change of bakery product so
20 that a batch can have any number of different products.

The computer program produces a graphical display on a visual display unit of a production schedule for each dough type as shown in FIG. 3 and FIG. 6. The schedules are produced for each dough type eg. white and

wholemeal dough. A shading system is used to differentiate the different bakery products. A key may be produced to represent the different products.

Different production schedules are produced for different dough types. The same batches of dough type are run consecutively as the machine must be cleaned between different dough types being used. Dough types are determined by analysing the codes for each of the bakery products.

The production schedule visually displays if a batch is not a full batch. For example, FIG. 3 shows that there is a short fall of 2kg in batch 9 ,and FIG. 6 shows there is a over supply of 2kg in Batch 12.

An operator can then choose to reduce or increase the number of bakery products to obtain a full batch. For example, after reviewing the production schedules of FIG. 3 and FIG. 6, an operator may increase the number of White Dinner Rolls from 240 to 260 and reduce the number of Wholemeal Rolls from 160 to 140 as shown in FIG. 2.

A new production schedule is then visually displayed as shown in FIG. 4 and FIG. 7. An operator easily sees that the batches are all full from the production schedules.

An operator is also able to move batches to different positions on the production schedules to change the order of production as shown in FIG. 5.

Once the final production schedule has been determined, then the total days flour requirement for each dough type is calculated the

following formula:

$$\frac{\text{Total Weight of Product/ Weight of Dough that 1 bag of Flour Produces}}{\text{Total No. of Flour Bags Required}} =$$

5 The flour can then be obtained from a storeroom prior to commencement of the production run.

Typically, the production schedule is produced at least one day before the production run is commenced. The computer program and database are utilised for this purpose. The production run can then be saved and retrieved when desired.

10 Once the production run is to commence, an operator retrieves the production run from a computer. The computer indicates the order of the batches and what products are produced in each batch. An ingredient list is then produced for the first batch. Ingredients typically include the amount of water, the amount of flour, the amount of yeast and any other ingredients.

15 The ingredients needed to produce a specified weight (for example 20 kg) of each dough type are contained in the database. The weight of each of the ingredients needed to produce the dough weight for the production run is calculated by multiplying the weight of dough that is to be produced by factor of the standard weight of dough located in the database.

20 It should be appreciated that some mixing machines may have automatic dispensing devices that may dispense some ingredients automatically. In this instance, the computer program and database may communicate directly with the mixing machine.

Once each of the ingredients is entered into the mixing machine and the operator confirms this on the computer, the mixing machine is then used to mix the dough. A mixing time for the type of dough is calculated and entered into the mixing machine.

5 When the dough exits the machine after it has been mixed, the operator is provided with a screen that shows the layout of dough pieces as they are to be arranged on backing trays and/or containers prior to proving and baking. Any instructions relating to the placement of the dough piece and any further ingredients are also indicated.

10 For example, for white cheese top rolls, a screen is produced that shows a standard baking try that has the rolls placed in a 3 x 4 configuration on the baking tray. The instructions include turning the dough piece over and placing it upside-down on baking tray and adding cheese to top of roll.

15 The computer program may also receive feedback from the mixing machine and operator. This feedback is stored in the database for retrieval and analysis. The following may be measured:

1. Machine efficiency = Mixing time vs Loading time of Ingredients.
- 20 2. Time that each products leaves the mixing machine to provide the individual batch mixing time, the total mixing time, the total lead time and the total time to produce the production run.
3. Any failed production e.g. incorrect ingredients.

4. Any amendments made to the production run.

This method allows for little to no wastage of dough. Further, an inexperienced operator can prepare bread products with little or no input from experienced personnel, as the operator needs to make very few decisions. Feedback can be viewed to assist in producing more efficient operations.

It should be appreciated that various other changes and modifications may be made without departing from the spirit or scope of the invention.

DATED this Twenty-second day of April 2002.

BAKENOMICS PTY LTD

By its Patent Attorneys

FISHER ADAMS KELLY

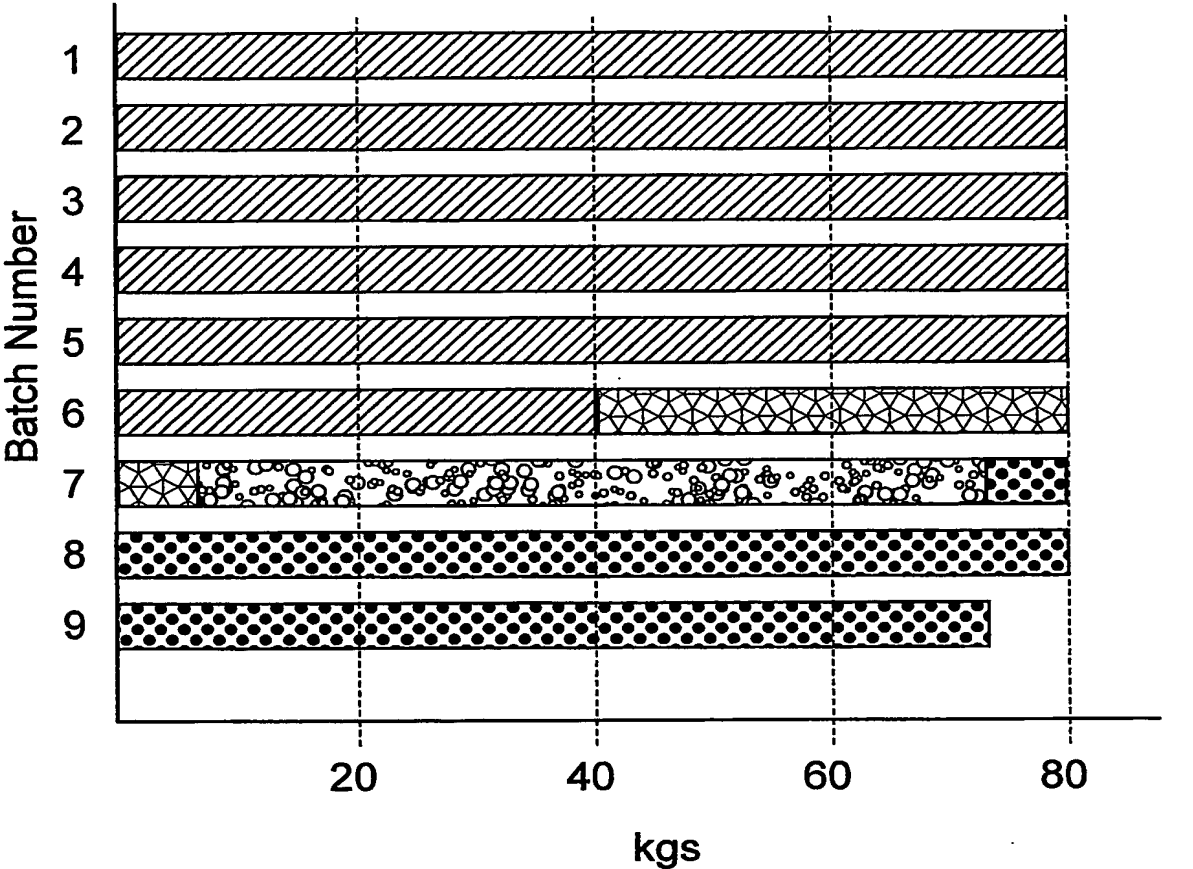
	Product weight (gms.)	Number Required	Total weight (kgs.)	Number of full batches (80kg)	Left over (kgs.)
White Hi Top	550	800	440	5	40
White Dinner Roll	50	960	48	0	48
White Lunch Roll	80	800	64	0	64
White Half Loaf	400	200	80	1	0
Wholemeal Loaf	800	160	384	4	64
Wholemeal Roll	100	640	64	0	64
Wholemeal Hi Top	550	800	440	5	40

FIG. 1

	Product weight (gms.)	Number Required	Total weight (kgs.)	Number of full batches (80kg)	Left over (kgs.)
White Hi Top	550	800	440	5	40
White Dinner Roll	50	1120	56	0	56
White Lunch Roll	80	800	64	0	64
White Half Loaf	400	200	80	1	0
Wholemeal Loaf	800	600	384	4	64
Wholemeal Roll	100	560	56	0	56
Wholemeal Hi Top	550	800	440	5	40

FIG. 2

White Dough Production Schedule



White Hi Top White Dinner Roll White Lunch Roll White Half Loaf

FIG. 3

White Dough Production Schedule

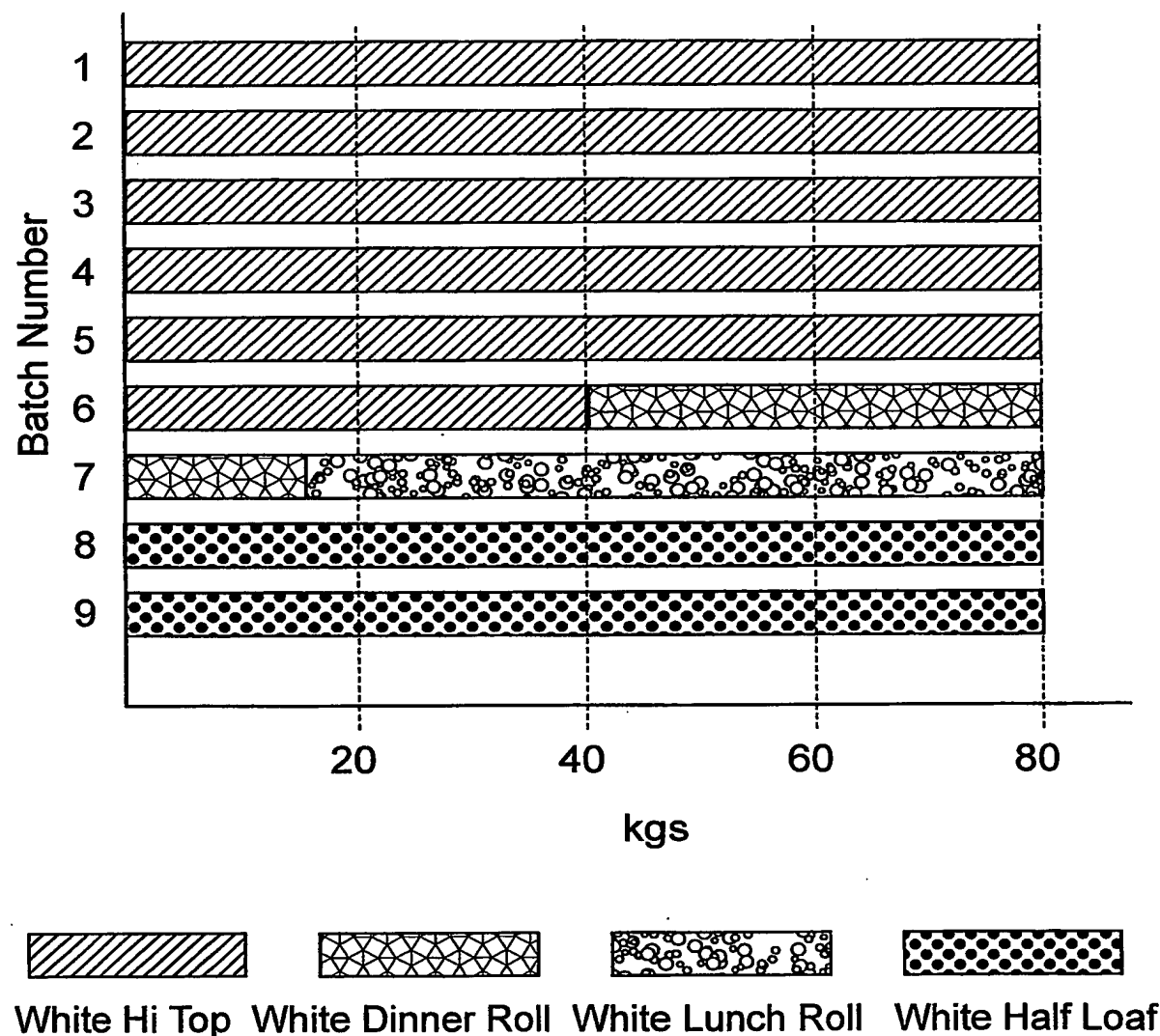


FIG. 4

White Dough Production Schedule

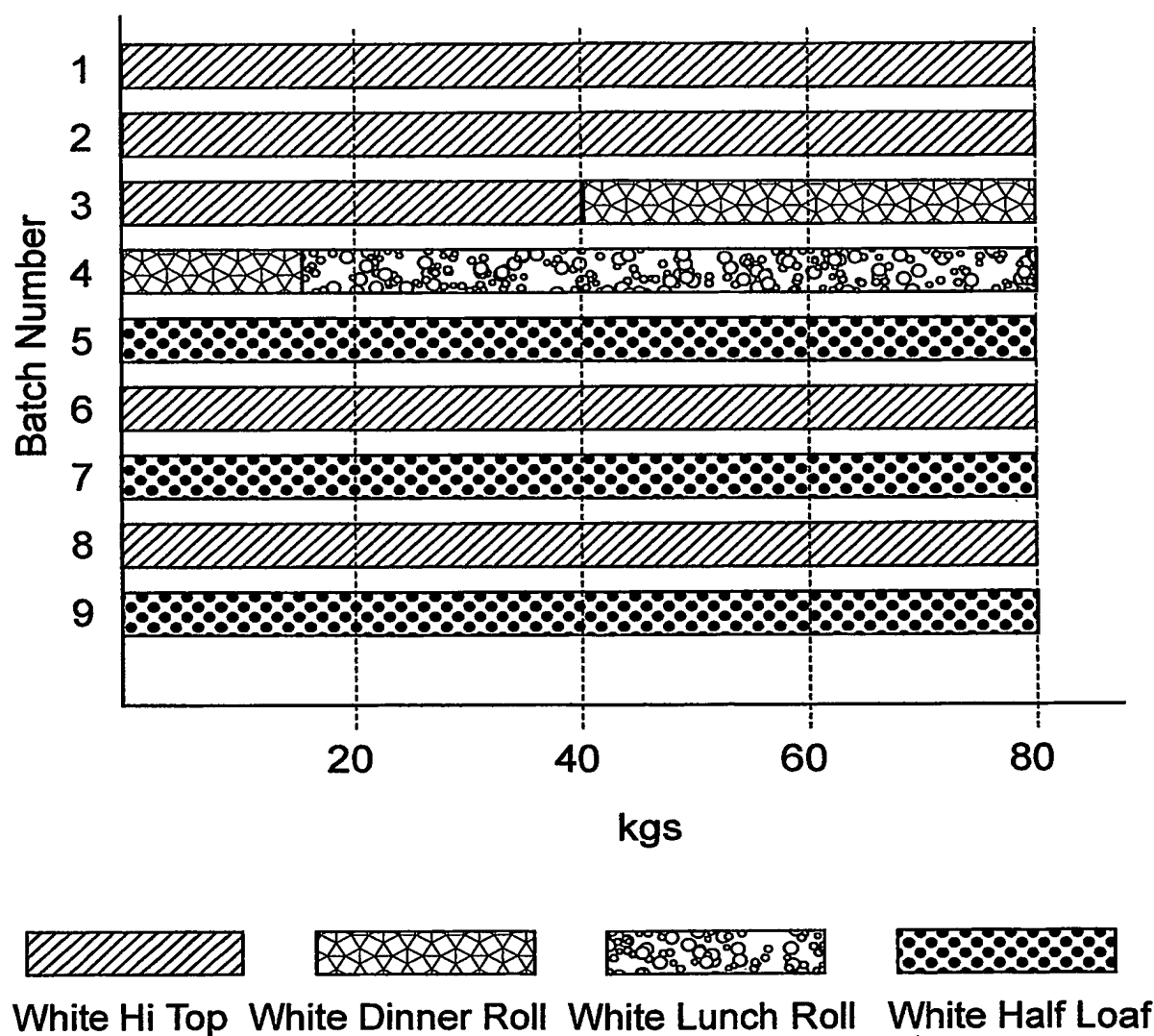


FIG. 5

Wholemeal Dough Production Schedule

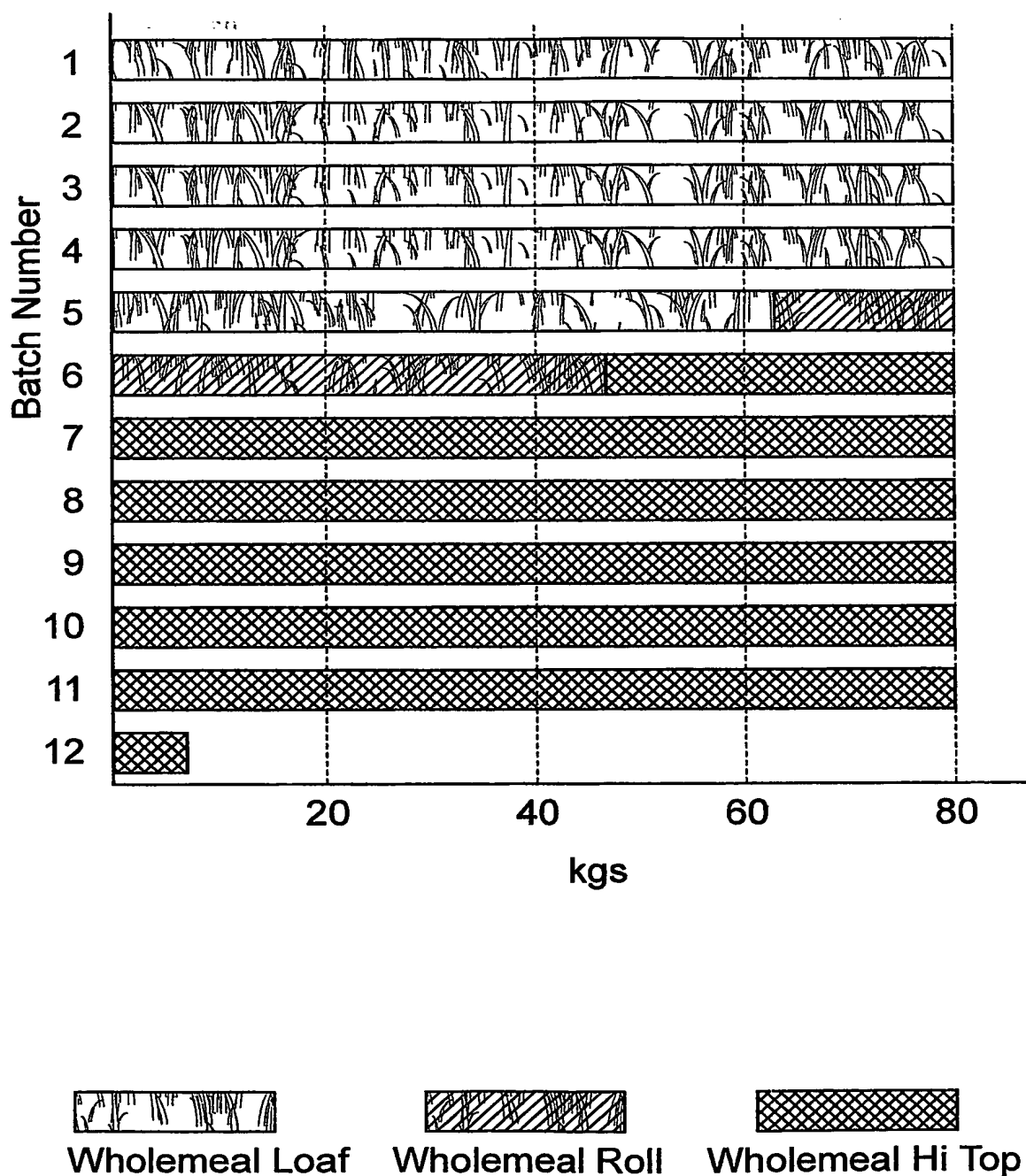


FIG. 6

Wholemeal Dough Production Schedule

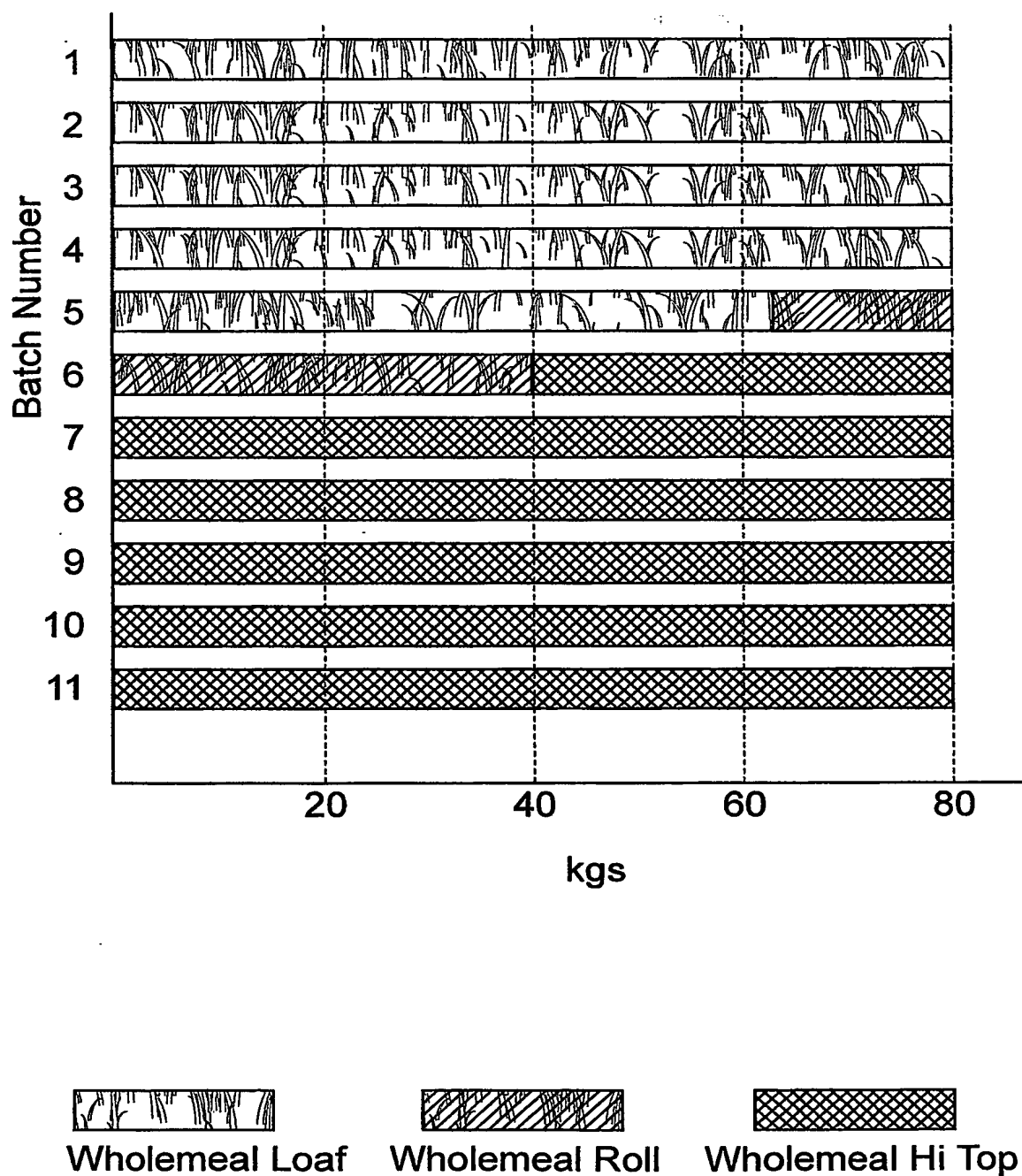


FIG. 7